segment, very slightly towards the pore side. It attains a transverse diameter of nearly 0·4 mm., and is more or less distinctly divided into two lateral portions. The yolk-gland (fig. 9, *vit.*) lies behind it, and has a maximum diameter of about 0·1 mm. Between the ovary and yolk-gland is the shell-gland.

There are from twenty to thirty testes (fig. 9, *t.*), arranged in a single layer at the back of the segment, in the median field, and not extending forward at the sides further than the level of the yolk-gland. Their average longest diameter (transverse) is about 0·05 mm.

Mature segments begin to appear at about the fortieth from the posterior end. There are only about eight segments with fully developed organs before the appearance of extra-ovarian eggs. It is doubtful whether a uterus with a definite wall ever exists—if so, it only persists through one or two segments. The ova seem from the first to be scattered at random in the parenchyme without a definite enclosing membrane. The onchospheres measure about 30 μ in diameter.

This seems to be only the second species of *Oochoristica* recorded from a snake. The other is *O. rostellata*, Zschokke, 1905*, from *Zamenis viridiflavus*. The present form appears to be more closely related to *O. rostellata* than to the various species from lizards, especially in the possession of a rudimentary rostellum, in the anterior position of the openings of the suckers, and in the excessively tortuous course of the lateral excretory vessels. It differs considerably from it, however, in dimensions and in the much smaller number of testes.

XXXV.—*Note on Young Specimens of* Anthenea *sp.*

By G. A. Smith.

Included in a collection of echinoderms recently made by A. Loveridge, Esq., at Dar-es-Salaam, G.E.A., are two dry specimens which may be referred to the above genus.

Recent reports on collections from the above neighbourhood and from the Indian Ocean have contained descriptions of young specimens of *Pentaceros* and *Anthenea*, suggesting affinities with certain known species; but, on account of the lack of a large and varied series of specimens and the high

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degree of variation known to occur in these genera, authors have refrained from making specific determinations. This tendency of modern echinologists to resist the temptation of unduly creating new genera and species is of advantage to systematic workers. Attention will be drawn below to the tubercles on the marginal plates, and a suggestion is offered concerning certain spines on the actinal surface. In order that the life-history of these and allied forms may be determined, it is essential that the records of all young specimens should be collated, and that a collection be made of a series of specimens showing the developmental stages. This need is emphasized by the suggestion that some species possess spines only during certain growth-stages.

Anthenea sp.

Two immature examples from Dar-es-Salaam, G.E.A., 15/1/19 ; littoral zone. Coll. Loveridge. No. 14.

The colour of one specimen is pale yellow and of the other pink. They are approximately the same size, the main dimensions being as follows :—

$$R=23. \quad r=12. \quad R=1{\cdot}9r.$$

Body stellato-pentagonal. Disc 6 mm. thick, not elevated ; arms 10 mm. broad at the base, tapering to 3 mm. at the distal end, round and slightly upturned. The lophial line is very distinct, and has fourteen rounded plates, the proximal five of which each have a blunt tubercle increasing in size towards the centre of the disc; the tubercles are roughened but not granulated. The interbrachial arc is subacute.

The dorso-lateral plates may be round or hexagonal, are large proximally, but diminish and become more regular in shape distally ; they are covered with well-defined small round granulations. On each side and including the lophial line there are three parallel rows of round plates, extending from the centre to the distal end of the arm. The lophial series reaches the terminal plate, the other two rows stop short at the fourth supero-marginal plate (counting from the distal end). Small valvate pedicellariæ are irregularly disposed on these plates, excepting on the lophial line. One specimen appears to have been dead when collected, for the plates on the abactinal surface are much more definite, owing to the granulations having become worn by friction or by the action of the waves. This has made evident an arrangement similar to that in *Anthenea flavescens*, which in the second specimen is but barely suggested, viz., of a diagonal disposition of two rows of four lateral plates, leading from an

interradial plate to an interbrachial arc. The plates are almost triangular, with the bases of opposed plates parallel. Proximally they are about 1 mm. in diameter, but the pair in contact with the supero-marginals is less; there is a faint fissure between the two rows. The pore-areas are round, slightly larger distally than proximally. All the plates of the apical system excepting the interradials bear tubercles, which here number from one to three and measure less than 1 mm. The central plate is composed of large granules which are heaped close together. There are about thirty-four and eighty-four tubercles on the abactinal plates of the respective specimens.

On the actinal surface the ventro-lateral plates are granulated, slightly convex, ovoid in shape, and decreasing in size as they approach the margin. There is a distinct row running on each side of the furrow and parallel to the ambulacral groove, extending to the third or fourth infero-marginal plate (counting from the distal end). The inter-oral plate is pear-shaped, and is the largest; several of the plates bear pedicellariæ. On the whole, the actinal face presents a closely tessellated surface. There is a well-defined furrow on each side of and parallel to the ambulacral groove; it is closely paved with very small round granules. Lying in the furrow are a number of small pedicellariæ with their long axes parallel to the groove. At the distal end of the arm, and on each side of the last two paired infero-marginal plates, are a series of six small blunt spines, which may be the result of the persistence of what was once a second row of adambulacral plates. The actinal distal end of the arm being slightly upturned, the spines would serve the purpose of very effective armature to an exposed part.

The adambulacral plates have three or four short, blunt, oval spines, not always equal; they are largest at the middle, but toward the oral region become short and thick; here, too, granules encroach upon their sides. There is one series only, and the plates in it are in contact with each other throughout.

There are fourteen supero-marginal and fourteen infero-marginal plates; both are granulated and take part in forming the sides of the arms; a well-defined line runs round the arms between the two sets of plates. The supero-marginals are convex and very prominent; at the interbrachial arc they rise 1 mm. above the disc, but distally they are almost level. The granulations resemble a mosaic of small plates, are distinct, of varying size, and generally round and slightly convex. Arranged transversely on these plates are one to six irregular dome-like tubercles, the majority of the plates

having three; in some they have become fused together and elongated. The tubercles themselves are not granulated, but are developed from the granules, and on some of the plates the process may be seen in various stages of development. At the interbrachial arc the plates are wedge-shaped, 3 mm. broad and 4 mm. long, but distally they become broader and square. The terminal plate is small, being about the size of the last paired marginal. Further, it is granulated and may have tubercles.

The infero-marginal plates approximate to the supero-marginals, but continue on to the actinal surface also, and are well-defined; the change in shape distally is well illustrated in both specimens. The granulations are more regular than on the upper series. On the second plate, counting from the interbrachial arc, tubercles begin to develop and increase in size and number toward the distal end of the arm; but they are not nearly so prominent as those on the supero-marginal plates. There are no pedicellariæ on the marginal plates.

The madreporite, which occupies an interradial position, measures 2 mm.; it is lozenge-shaped and coarsely striated; the striæ radiate centrifugally, very little convolution being noticeable. It is surrounded by a ring of evenly placed granules.

The specimens are undoubtedly young examples, and correspond in some respects to the description of *Anthenea* sp. described by Simpson and Brown (1), and also have certain affinities with *Siraster tuberculatus* described by Clark (2). But the differences are so marked that it is not possible to accept Clark's very full generic and specific diagnosis as applicable to the present specimens. Kœhler (3) gives a very short account and a figure of *Anthenea* sp., juv.; but he does not refer to the ambulacral region, the description of which is essential to a correct identification of the specimens. The absence of tubercles from the centro-radial plates and from the supero-marginals are points wherein Kœhler's specimens differ from those above described.

Literature.

(1) Simpson, J. J., and Brown, R. N. Rudmose. 1900. "Asteroidea of Portuguese East Africa." Proc. R. Phys. Soc. Edinburgh, xviii. (1910–1912) p. 50.

(2) Clark, H. L. 1915. "The Echinoderms of Ceylon, other than Holothurians." Spolia Zeylanica, x. pt. 37 (1915), p. 86.

(3) Kœhler, R. 1910. "An Account of the Shallow-water Asteroidea." Echinoderma of the Indian Ocean, pt. vi. p. 91, pl. xvi. fig. 1.